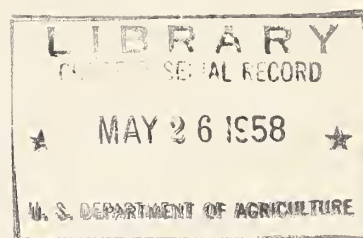


Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

81.9
76 Fm

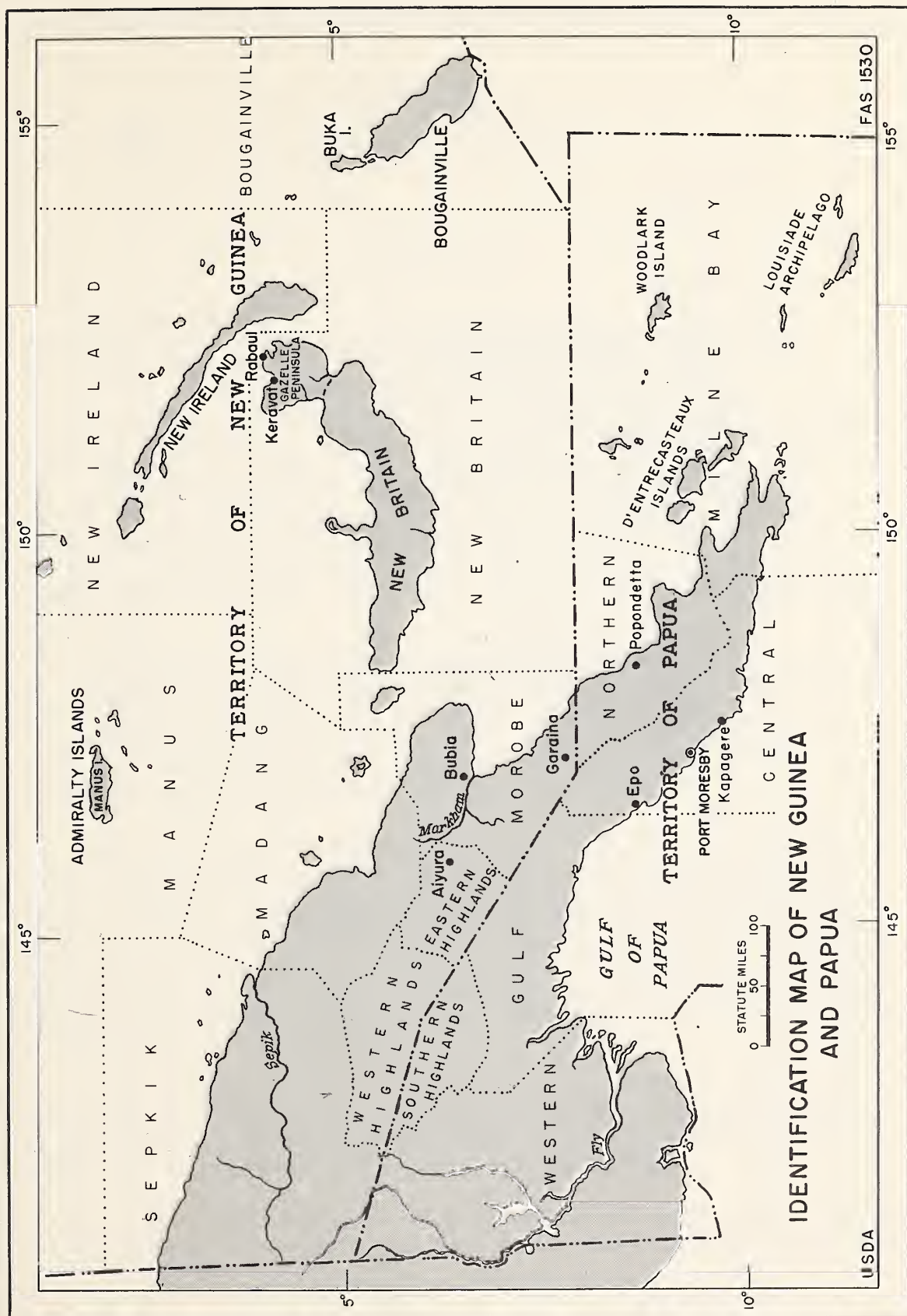
+70 50
FAS-M-35 May 1958 //



AGRICULTURE

in New Guinea and Papua

Foreign Agricultural Service, UNITED STATES DEPARTMENT OF AGRICULTURE



CONTENTS

	<u>Page</u>
Introduction	1
Foreign Trade	3
New Guinea	4
Climate and topography	4
Land ownership and utilization	5
Agricultural policy and development	6
Types of farming	7
Export crops	8
Other commercial crops	11
Livestock	12
Marketing	14
Cooperatives	15
Papua	16
Climate and topography	16
Land ownership and utilization	17
Agricultural policy and development	17
Types of farming	18
Principal crops	19
Livestock	22

AGRICULTURE IN NEW GUINEA AND PAPUA

Mary Ellen Long,
Far East Analysis Branch

Introduction

The eastern half of the island of New Guinea, together with adjacent islands, is under the control of Australia. This vast territory is divided into two main units--New Guinea and Papua.

Australia governs New Guinea and Papua in an administrative union. Legislatively, this joint governmental function is provided for in the Papua and New Guinea Act of 1949. The Act provides that the identity and status of New Guinea as a Trust Territory and the Territory of Papua as a Crown possession shall continue to be maintained. It also provides that the final interpretation of the basic legislation provided for these areas shall be vested in the Minister of State for Territories with headquarters in Canberra, Australia.

The actual governing of the two areas is under the jurisdiction of a special administrator. He directs the activities of twelve functional departments. The headquarters of this central administration is located at Port Moresby in the Territory of Papua. This combination of legislative and administrative functions is important to agricultural development in both territories.

Agriculture is probably the most basic industry of both areas. The Commonwealth of Australia has undertaken the responsibility of promoting the development, improvement, and increased production of crops to satisfy the territories' consumption requirements and to provide surpluses for export. The ultimate goal is to develop agriculture in such a way that the resources of the land and forests will be conserved for future generations. Special attention is given to administration of land policy rights and improvement of agricultural conditions for native producers.

A central Department of Agriculture, Stock and Fisheries with headquarters at Port Moresby implements these general provisions of agricultural policy and also administers agricultural experiment stations and extension facilities for both territories.

All agricultural research is combined for the two areas. Research coordination is also maintained with the Commonwealth Scientific and

Industrial Research Organization in Australia and the South Pacific Commission headquarters in Noumea, New Caledonia.

Under the provisions of the Papua and New Guinea Act, the revenues of both of these territories are supplemented by direct grants from the Government of the Commonwealth of Australia. In late years these grants have totaled about £A 9 million.

Foreign Trade

The foreign trade of both Papua and New Guinea is based chiefly on the export of such primary products as agricultural raw materials, forest products, gold, and shells. Agricultural commodities account for about 70 percent of the total value of all exports. Imports consist largely of manufactured goods and processed foodstuffs. The bulk of the foreign commerce is controlled by European and Asian enterprises. The value of New Guinea's trade is almost double that of Papua and is more nearly balanced than Papua's, probably because of New Guinea's longer period of agricultural development.

Australia provides a ready market for an appreciable portion of these territories' tropical products, such as copra, rubber, timber, cocoa, and coffee. The United Kingdom is the second largest market outlet. For most agricultural exports to Australia, no duty applies.

Marketing and trade in both Papua and New Guinea are subject to joint administrative control patterned after Australian policy. Import restrictions were adopted in 1952 and amended in 1955 to conserve foreign exchange. Licenses are necessary for all imports and exports originating from sources other than Australia. Legislation provides for collection of both import and export tariffs on all trade with countries outside Australia. Exports of both areas are accorded preferential and special tariff treatment of primage duty when entering Australia. No preferential tariffs exist for imports into Papua or New Guinea.

Copra, the staple export product, is marketed through the Papua and New Guinea Marketing Board, a government-controlled agency established in 1952. Copra and related products account for 50 percent by value of the total exports each year. From 1948 through 1957, exports from both New Guinea and Papua were consigned to the United Kingdom and Australia under the provisions of a long-term bilateral agreement. This agreement provided price stability for the New Guinea and Papua products well above world market levels.

U. S. agricultural trade with both of these areas is limited at the present time. Future possibilities will depend pretty largely on the extent to which both of these territories continue to develop and achieve higher standards of living. The principal commodity now supplied by the United States is a tobacco product known as twist tobacco, a type of chewing tobacco. It is consumed by the natives and in recent years has been imported in increasing quantities, with the United States supplying the entire amount.

New Guinea

The area popularly known as Australian New Guinea consists of the island of New Guinea north of Papua and east of Netherlands New Guinea (West Irian). It also includes the islands of the Bismarck Archipelago (New Britain, New Ireland, and Admiralty Islands) and the two northernmost islands of the Solomons--Bougainville and Buka. One of the largest island areas of the Pacific, the Trust Territory of New Guinea is slightly smaller than the State of Wyoming and about nine-tenths the size of New Zealand. With a total land area of 93,000 square miles, this region extends 8 degrees south of the equator--a distance of 400 nautical miles--and ranges from 141° to 160° E., a distance of 1,000 nautical miles.

The total population was estimated in 1956 at about 1,290,000. With the exception of 13,000 Europeans, Australians, and Asiatics, the bulk of the population consists of natives. These indigenous people are classified broadly under five types--Papuan, Papuo-Melanesians, Negritos, Micronesians, and Polynesians. It is difficult to place the natives in specific categories, as they are also classified by linguistic groups with many modifications of the original languages now in existence. Europeans number about 10,000 and are located in the coastal areas and urban centers; the Asiatics, chiefly Chinese, total over 2,000 and are situated mainly on the Island of New Britain and coastal areas of northern New Guinea.

Climate and Topography

The outstanding characteristic of the climate of this area is its monotony. None of the variable weather conditions of the Temperate Zones exist and the recognized distinctions of summer and winter are replaced by wet and dry seasons.

Two high mountain ranges traverse the mainland from west to east, and much of the flat land in the western area of the territory between the two ranges is swampy. Lying wholly within the Tropical Zone and situated as it is between the continents of Asia and Australia, the Territory of New Guinea has a typical monsoonal climate. This monsoonal condition is also affected by the two mountain ranges, and divides the year into two definite wind seasons. The northwest monsoon season prevails from December to March, with the winds blowing from either the west or northwest. The southeast monsoon season occurs from May to October, and at that time the trade winds blow inland from a southeast or easterly direction. Both of these winds pass over large expanses of ocean before reaching the islands and are

heavily laden with moisture. The precipitation of this moisture over the islands results in heavy rainfalls; most of the region has an average annual rainfall in excess of 100 inches.

The heaviest rainfall occurs on the coasts and mountain ranges exposed to the steady southeast trade winds. Southern New Britain and the higher mountains of the Huon Peninsula receive an average of 250 inches of rainfall or more a year; other enclosed valleys in the central highland regions lie in what is known as a rain-shadow zone, and have an average annual rainfall of only about 56 inches.

The heavy rainfall of New Guinea, New Britain, New Ireland, and Bougainville, coupled with the large area of steep slopes with rapid run-off, has been responsible for a large number of rivers with a very large volume of water. Chief of these are the Sepik, the Ramu, and the Markham. Most of the rivers are not navigable except by canoes or small launches in the lower areas.

Although the territory contains extensive areas of grass country, the grass plains are few. The principal ones are those of the middle and lower Sepik, the flats of the Markham Valley, and some of the undulating country of the Purari Plateau, between the headwaters of the Ramu River and Mount Hagen. Riverine and tidal swamps also characterize the terrain of the entire area.

The 600 odd islands that make up the territory differ widely in structure and surfaces. Some are volcanic craters and coral reefs, which rise abruptly from the ocean.

Only a relatively small portion of the territory has natural soil conditions suited to agriculture. The greater part of the island and mountainous country is covered with shallow, heavily leached and poor soils, generally resulting from the heavy rainfall and poor drainage. The most fertile soils are located in the broad valleys and in the plateau regions of the central mountains. These areas have either rich alluvial or volcanic soils. The soils of the coastal areas vary from sand to sandy loam, usually overlying a subsoil of broken coral, a combination ideal for growing coconut palms. From data now available, it would appear that the greatest possibilities for agricultural development are in the regions where these two soil types occur. For both the alluvial and volcanic soils, the greatest fertility seems to be in the newer soils, as the more mature soils of New Guinea are subject to leaching.

Land Ownership and Utilization

The administration representatives of the Australian Government examine land available for agricultural and pastoral development. They

prepare land-use plans which divide the land into areas of proper size to assure the most efficient use. Agricultural and pastoral leases, particularly to nonnative residents, are granted only in accordance with these plans.

Land in the territory is classified into four categories: (1) Native owned, (2) freehold, (3) administratively controlled, and (4) ownerless. All unalienated land is deemed to be native-owned unless proved otherwise. The succession to land generally is established by birth and inheritance entitlement rights. This policy varies in accordance with community customs.

Land used for gardens is sometimes individually owned, but in most instances, garden areas are the common property of family groups residing within the village or community. Many communities have a flexible policy of allowing outsiders temporary or seasonal use of land, but take a very firm stand when the matter of actual land ownership arises.

Land is also available under lease arrangements for crops and pastoral uses. Three kinds of leases prevail in New Guinea: (1) Agricultural, (2) dairying, and (3) pastoral. Most leases are for a term period of 99 years, with the exception of pastoral leases, which do not exceed 30 years. Pastoral leases are limited to approximately 10,000 acres in size. Agricultural leases are also subject to improvement stipulations whereby the lessee is required to plant approved crops within a specified period after acquiring the lease.

Nonindigenous inhabitants of New Guinea, such as Europeans, Australians, and Asiatics, can acquire land for agricultural purposes only on the basis of leases. About 518,000 acres of land are held in this lease form by non-native producers.

The importance of the native population's land rights has always been recognized by the Australian Government in its capacity as the administering authority. The most important safeguard is the provision that land owned by the indigenous people may be transferred only to the Administering Authority Government. Certain conditions must be fulfilled before even this type of transfer can be made, such as (1) a just price, (2) owners' willingness to sell, (3) government certification that any transfer of land rights by the natives to the government would not be detrimental to their present or future welfare.

Agricultural Policy and Development

In general the agricultural development program for New Guinea has three broad objectives:

(1) The improvement of the agricultural methods of the native population, with the aim of increasing the output and the nutritional level of the people.

(2) The increase in production of certain food commodities, such as rice, meat, dairy products, and certain fruits and vegetables, which are at present imported into the territory.

(3) The increase in production of certain commodities for export; namely, copra, cacao, rubber, coffee, fibers, peanuts, and passion fruit.

Other development programs have been adapted to specific commodities, such as coconuts, cacao, and rice, and are discussed in detail in the respective commodity statements.

Plant research and extension services in all forms of crop husbandry are dispensed from four stations--Keravat, in New Britain; Bubia in Morobe near Lae; Auyura, in the Eastern Highlands; and Garaina, in Morobe near the Papuan border.

Seven local agricultural stations provide direct services to farmers in the Districts of Madang, Sepik, Manus, Bougainville, Western Highlands, Morobe, and New Britain. Agricultural officers located at these district stations give assistance to growers, distribute seeds, make studies of indigenous methods of farming, and encourage natives to adopt sound agricultural practices.

So far, New Guinea has been relatively free from many important insects and plant diseases which ravage crops. This is surprising in that effective quarantine measures have not been adopted throughout the area because of the lack of trained personnel. Many standard pesticides have been introduced to combat crop damage, but some have not proved effective under New Guinea climatic conditions. Further research will probably be necessary to produce special pesticides for localized conditions.

Types of Farming

Three primary types of farming prevail: European, cash cropping, and subsistence. The European or plantation type is confined chiefly to the production of coconuts, cacao, coffee, and peanuts for export. Peanuts, rice, and truck crops are also grown on plantations and used mostly for domestic consumption.

Cash cropping by the natives is being developed in conjunction with subsistence farming and is encouraged by the Australian Government. This type of agriculture not only has the advantage of insuring food supplies and cushioning the native population against the effects of market fluctuations, but also provides additional cash income from the sale of crops.

Subsistence agriculture is most widely practiced by the natives and is based on a simple "bush fallow" cultivation. The inhabitants of each village are assigned garden areas surrounding the community or village area. Each garden area may be made up of a number of distinct plots owned by individuals or family groups. These small tracts may also be located some distance from a village and do not usually join each other. The size and number of these plots depend on the size of the village and the fertility of the soil.

As a rule, this type of cultivation follows a standard pattern. First, the bush and undergrowth are cleared with axes and knives; then, the timber and undergrowth are allowed to dry; and finally, the entire area is cleared by burning. The crop is then planted with little, if any, ground preparation. In some localities root vegetables are planted in holes dug in the ground with sticks. As a general rule when the crop is harvested a new plot of land is selected, cleared, burnt, and planted for the next crop. Occasionally, growers return to the first cropped area to harvest fruits, such as papaws and bananas, which they had planted.

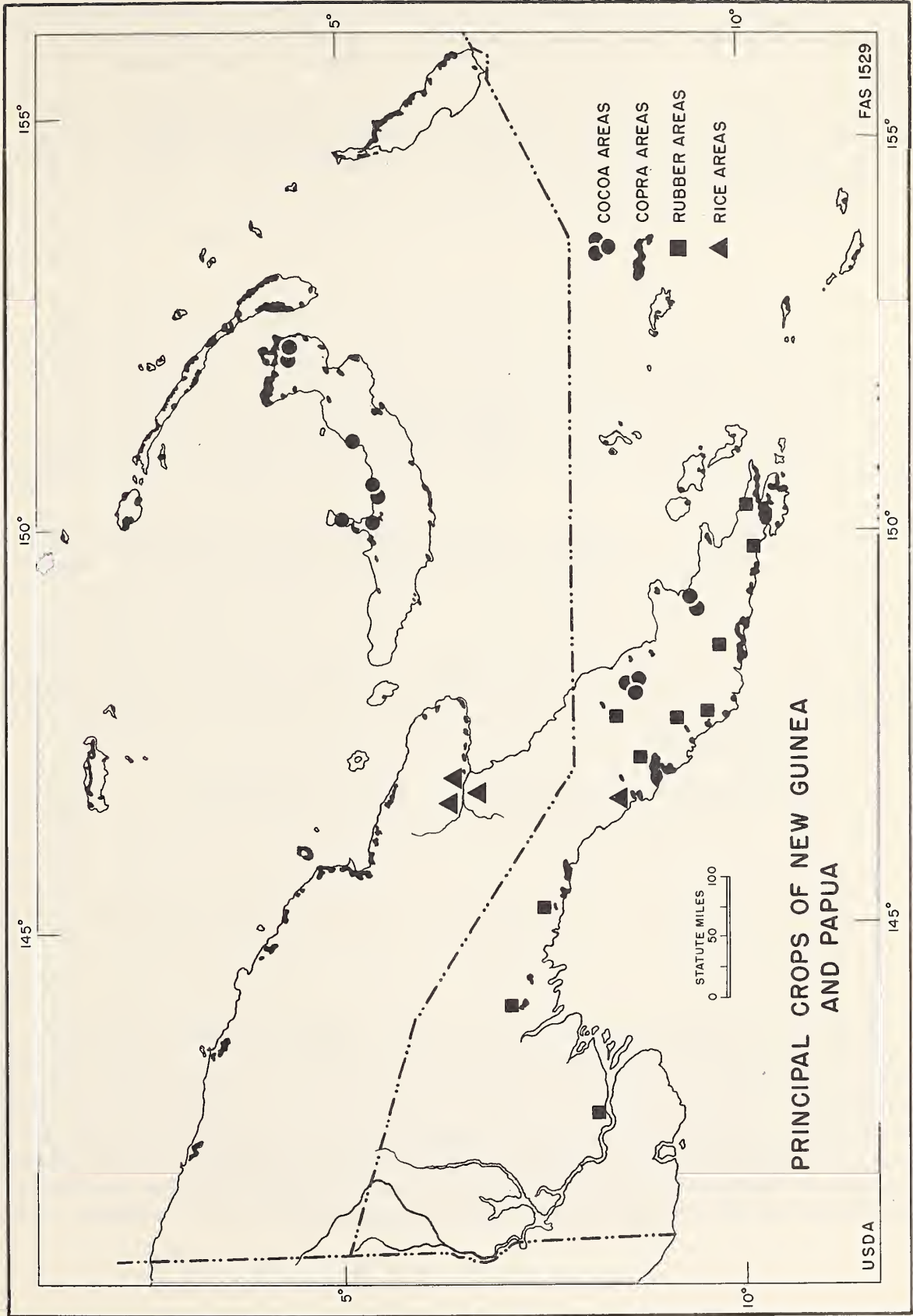
Many variations in native cultivation occur throughout the territory. In some places, careful attention is given to soil preparation and weeding of crops during growth. In localities where soil fertility is good, the same garden areas may be kept in production for 3 to 6 years or longer, while other plots may lie fallow from 7 to 8 years, depending on the local population's need for land and food. In some of the highland areas the village system of gardens is not followed. Here the natives cultivate their own single farm plots. Also, in some localities primitive irrigation systems have been found, consisting of contour ditches or bamboo piping.

The village gardens are planted by both men and women. The division of labor is governed by the customs of a particular village or area and is not uniform for all regions.

Contrasts in the various types of farming is also illustrated by the different products produced in different localities. Natives, engaged in cash cropping, produce coconuts, cacao, rice, hemp, cassava, bananas, sorghum, maize, white potatoes, peanuts, coffee, and passion fruit. In subsistence agriculture, emphasis is placed on production of sago, yams, taro, sweetpotatoes, coconuts, bananas, papaws, maize, cassava, sugarcane, and pulses.

Export Crops

Coconuts.--Coconuts comprise the most important crop of New Guinea, New Britain, New Ireland, and the northern Solomon Islands, Buka and Bougainville. Coconut palms cover more than 90 percent of the land occupied by plantations in those coastal and island areas. The



PRINCIPAL CROPS OF NEW GUINEA
AND PAPUA

USDA

FAS 1529

Gazelle Peninsula in northeastern New Britain alone has approximately half the total acreage of coconut palms and another one-fourth of the total is located in the coastal areas of New Ireland. The remainder is scattered along the northern coast of the New Guinea mainland and the coastal areas of Buka and Bougainville. Individual plantations vary in size from 25 to 2,000 acres. Coconut products, such as copra, coconut oil, and oilcake, comprise the main exports and are the chief sources of agricultural income.

Table 1, --New Guinea: Principal agricultural exports, average 1934-38, annual 1951-57 ^{1/}

Product	Average 1934-38	1951	1952	1953	1954	1955	1956	1957 ^{2/}
	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>
Copra	77,595	72,017	69,848 ^{3/}	78,604 ^{3/}	99,728	85,660	88,075	87,854
Cacao	172	355	532	703	799	1,210	1,580	2,332
Coffee	32	36	38	50	94	115	208	308

NOTE: Data are not available for both native and non-native production. Exports are believed to include native marketings and more representative of actual cash crop production.

^{1/} Year ending June 30. ^{2/} Estimated. ^{3/} Includes coconut oil.

With the revival of this staple crop in the postwar period, attention is now being given to a greater expansion of production. As a result, in 1954 a Coconut Action Plan was adopted. This plan was devised for the maintenance and development of coconut production. It provides for land surveys for new plantings, disease investigations, propagation of better seed nuts, research on alternative crops for areas going out of production, adoption of improved methods of preparation of product for the market, and promotion of crop efficiency through cost studies of production,

mechanization, and other labor-saving practices. The bulk of the 1955 survey work provided for in the plan was concentrated on New Ireland, where the problem of declining yields seemed to be most acute.

All copra exported to Australia is crushed for the extraction of coconut oil. The crushing makes available a byproduct in the form of coconut meal or cake, which is a valuable stock or poultry food. The oil obtained is used for a variety of processing, such as for margarine, household and industrial fats, soap, pharmaceutical products, and cosmetics.

Copra production has been the principal agricultural industry in New Guinea for many years. Before World War II there were more than 650 coconut plantations, and production reached approximately 90,000 tons a year. The plantations suffered severely during the war, but rehabilitation has been rapid and nearly 500 plantations are now producing about 80,000 tons a year, valued at about £A6,500,000. The plantations are situated mainly along the coast and on numerous small islands adjacent to the mainland.

As a complement to the agricultural side of this industry, a copra crushing mill was established in 1953 by a private firm at Rabaul, in New Guinea, which extracts the oil by crushing the copra.

Prospects are good for further development of the copra industry. In the event of an unfavorable price situation the best insurance for farmers would be the planting of such alternative crops as cocoa or manila hemp.

Cacao. --Cacao is the second most important plantation crop in New Guinea. Production is concentrated in the Gazelle Peninsula. Interest in cacao plantings has intensified in recent years, and the native population are not only being encouraged to plant this crop along plantation lines in volcanic and rich alluvial soils but are making rapid strides in increasing production. Some information sources indicate that present plantings coming into full bearing in 1963 should provide exports of about 10,000 short tons. These exports would probably be destined for Australia and would account for about one-third of Australia's imports on the basis of the country's present consumption requirements.

A Cacao Action Plan similar to the one adopted for the coconut and copra industry was adopted in 1954. This plan endeavors to stimulate expansion of production by coordination of research and extension services. Emphasis is also placed on intensification of native production and improved harvesting, fermenting, and marketing methods. It has been authoritatively reported that any large-scale development program for cocoa in this area would require a greater supply of labor and the adoption of certain types of mechanization.

New Guinea is one of the few areas in the world where two permanent crops--cacao and coconuts--can be grown together in the same plantation without apparent competition between the two crops.

The scarcity of labor and capital in many of the island cocoa areas is a limiting factor in development. A great deal of extra labor has been employed since World War II in cleaning plantations damaged by war, but considerable rehabilitation work still remains to be done.

Passion fruit.--Passion fruit was introduced by Europeans in private gardens but has proved so adaptable to the country that it is now a popular item of production in the native village gardens, particularly in the highland areas. A ready market exists for this fruit, which requires little skill in cultivating and provides a worthwhile supplement to the native producer's cash income. But transportation from the highlands to the processing plants is difficult; if this problem could be eliminated there would be approximately 80,000 more suppliers.

Other Commercial Crops

Rice.--Advanced experiments have been undertaken in mechanized dry rice cultivation at agricultural stations in the districts of Sepik, Madang, and Morobe on the mainland of New Guinea. More than 300 villages with approximately 25,000 natives were included in the project in 1953. This crop is being developed as an income source for natives and also to satisfy domestic food requirements. In the lowlands of New Guinea there is a very promising potential for irrigated rice as a commercial crop. The wide valley floors and immense swampy and alluvial deltas appear to offer European producers the opportunity of considerable expansion of rice acreage, providing modern methods of irrigation, drainage, and mechanized land clearing and cultivation can be established. Estimated production of paddy rice in 1955-56 was over 1,000 tons as compared to 10 tons in 1951. Of the present production, 900 tons is produced by natives.

Tea.--Tea has been promoted as an export crop and considerable research and development work has already taken place on experiment stations or plantations. Tea is believed to be particularly adaptable as a plantation crop in certain highland areas of New Guinea, and a separate tea experiment station has been located at Garaina in mountains of southeastern New Guinea, for special research in this commodity.

Coffee.--At the present time commercial production of coffee is not important but interest in the crop is increasing. Many new holdings are being established, particularly in the highlands. Considerable research has been performed by Australian interests, both government and private, in an effort to determine the types of coffee which can be grown most

effectively and the areas most adapted to coffee planting. It has been determined that strains of both Arabica, a highland variety, and Robusta, a lowland variety, are suited to growing conditions in this territory. The planting of the Robusta has also been found adaptable to interplanting with coconut palms.

Kenaf.--Production of kenaf has not been commercially established in New Guinea, but satisfactory experiments have been made in plant propagation at the Keravat Agricultural Experiment Station near Rabaul in New Britain; and government research on this fiber will probably be continued, as results have shown that kenaf could be a profitable commercial crop if a greater demand for the fiber ever arises.

Peanuts.--Peanuts are proving to be a popular crop with the natives and are grown in combination with tree crops in some plantation areas.

Experiments and investigations are also under way to determine the adaptability of such commodities as rubber, tobacco, kapok, cassava, ginger, nutmeg, cinnamon, pepper, vanilla, tung oil, oil palm, candle-nuts, cotton, derris, soybeans, castor beans, grasses, and fodder crops to New Guinea's agricultural conditions for production in commercial quantities.

Fresh vegetables and fruit.--Many European vegetables can be readily grown in both Papua and New Guinea. In certain localities, the cultivation of such fruits as citrus, pineapples, papaws, bananas, and custard apples presents little difficulty.

Surveys show that the local markets for fruit and vegetables are the larger centers, such as Port Moresby, Lae, and Rabaul. Current developments indicate that the requirements of these centers can be adequately met from existing sources.

Commercial, mechanized production of food crops, particularly roots, is profitable in some areas.

Livestock

Aside from pigs and poultry, which are numerous in the native villages, livestock is limited primarily to agricultural experiment stations and plantations.

Pigs and chickens are kept by the natives under primitive husbandry conditions. These animals are rarely kept in enclosures but allowed to roam freely. Hand feeding is irregular, aimed more at keeping animals domesticated than providing them with any definite dietary level. The eating of pork by the natives is confined almost entirely to ceremonial occasions. Pigs run wild through many parts of the interior regions of New Guinea. The typical native fowl is small, lean, and leggy with variegated plumage. Egg production is at a very low level; the chicken in New Guinea is prized principally for its colored feathers.

Prior to World War II some 20,000 cattle were kept on copra plantations to keep down the grass in the groves and provide meat for food. Nearly all of them were destroyed during World War II, and restocking did not begin until 1947. Consideration is again being given to restocking copra plantations which are not interplanted with cacao. In 1955 the cattle throughout the territory numbered about 6,000.

Considerable emphasis has been placed on sheep since World War II. Settlers, missions, and agricultural experiment stations maintain small flocks. The largest flock is located at Nondugl in the Western Highlands, where a full-scale enterprise in intensive sheep farming has been introduced. Wool was exported for the first time in 1951.

Almost all fresh and processed meats and dairy products consumed in the territory are at present imported at very high prices. There is an assured market for any of these products locally produced. The extensive grasslands offer good scope for the development of a grazing industry.

Developmental plans to make the territory self-sufficient in meat lie in the direction of breeding a strain of cattle suitable for the New Guinea climate. British breeds of cattle thrive in the highland areas of the territory, but efforts are being made to develop a suitable breed for tropical conditions by crossing British breeds with the Zebu. Two Zebu strains, the Sindi and the Sahiwal, were recently imported from Pakistan under the Colombo Plan, and the Nellore type of Zebu was also imported from the United States. Intensive stock raising, rather than range grazing, is favored by experts, because the relatively high rainfall permits more effective pasture management and fodder production than is usual on cattle lands and because of easier control of parasites. Under these conditions, it is estimated that carrying capacities as high as one head per acre can be attained.

Interest has also been displayed in the possibilities of raising livestock in the drier elevated plateau interior in the upper Markham, Ramu, and Purari valleys between Lae and Mount Hagen in the southern part of the New Guinea mainland. Private and governmental interests are conducting experiments with mixed-cropping and livestock farms in these areas. In this way, efforts are being made to intensify agriculture by controlling animal diseases, combating soil erosion, and maintaining soil fertility.

In some localities there is now a growing appreciation of the use of animals as beasts of burden. In the Finschafen, Morobe, and Highland areas, the native population have acquired donkeys on loan from the Australian Government and are using them successfully as a means of transporting produce to market.

Table 2.--New Guinea: Livestock numbers, prewar and 1951-57 1/

Item	Prewar	1951	1952	1953	1954	1955	1956	1957 <u>2/</u>
Cattle	19,033	2,008	1,892	2,928	4,644	6,059	6,805	7,610
Goats	9,087	987	1,394	1,672	1,769	2,131	2,422	<u>3/</u>
Pigs	6,225	2,403	2,785	3,809	4,382	4,684	4,959	<u>3/</u>
Sheep	1,565	1,591	1,772	1,516	1,560	1,229	1,561	1,346
Horses	1,095	294	391	405	511	571	710	754
Poultry <u>4/</u>	<u>3/</u>	15,408	20,846	22,600	6,801	<u>3/</u>	<u>3/</u>	<u>3/</u>

1/ Non-native holdings, 2/ Estimated, 3/ Not available, 4/ Commercial flocks.

Marketing

Much of the commercial trading is handled by Europeans or Asians and is relatively free of restrictions. Since 1951 increased interest has been shown in cooperative societies, particularly by the natives as marketing facilities for their cash crops.

The marketing of copra is controlled by the New Guinea Copra Marketing Board established under the Papua and New Guinea Copra Marketing Board Ordinance of 1952. Membership in the Board is made up of producer representatives.

Native planters process their copra in their own driers from nuts grown in village groves and market it through the cooperative societies or private traders to the New Guinea Copra Marketing Board in the same manner as the European and other plantation producers do. The agricultural extension services maintained by the administration promote high standards of copra processing among the native producers in an effort to

secure a quality product for marketing. All growers are installing better and more efficient driers, and further improvement in copra quality is expected.

Another effort to get quality copra was made when price differentials were established for different qualities by the Copra Marketing Board in 1954. In March 1955 a copra inspection service was also reintroduced.

Practically the entire production of copra is exported, and the market price has been determined from year to year under the terms of a long-term bilateral agreement between the United Kingdom and Australia.

Cooperatives

Originating in New Ireland, the cooperative movement spread to Bougainville and is now well established in New Britain and Manus Island as well as in the mainland areas of Sepik and Madang. Although cooperative marketing is participated in by both native and non-native producers, it is a program that has attracted considerable native interest. Growth was aided by the passage of a Cooperative Societies Ordinance in 1950. In 1955-56 cooperative societies totaled 96.

Cooperative development has been along two lines--one dealing with consumer goods distribution and the other with production. Although these functions have been combined into a single enterprise, marketing of domestic production and retail distribution of consumer goods are two separate activities, particularly in relation to the native economy.

The Administration has put particular emphasis on cooperative education for the natives, which has met with good response and has been quite successful. Copra has been the leading agricultural commodity marketed through cooperative facilities.

Papua

Papua, a territory of Australia since 1906, comprises the southeastern portion of the island of New Guinea. It lies south of the Trust Territory of New Guinea and east of Netherlands New Guinea. The mainland of Papua covers an area of 87,806 square miles. In addition, the territory consists of such groups of islands as Trobriand, D'Entrecasteaux, Woodlark, Laughlin, Conflict, and Louisiade, which extend over an extra 2,794 square miles and comprise the extreme eastern end of the region, making a total land area of 90,600 square miles.

Prior to World War II, annual subsidies made by the Australian Government for Papuan development never exceeded £A50,000. Since 1950, Australia's grants have averaged £A2.2 million each year. Much of this expenditure has had to be made on public facilities, such as roads, communications, and health and education services in an effort to try to interest private capital investment. The predominant supply of labor is native and requires a long period of training and adjustment to modern production techniques.

In 1940, when the Japanese invaded the area, Papua was still largely primitive, with only slight development of agricultural crops such as copra, rubber, and coffee. Agriculture as it exists today has come in the past 12 years.

The total population of Papua is approximately one-half million people, with the native inhabitants comprising about 98 percent of the total figure. Most of the indigenous population of this area are of Papuan and Melanesian extraction. Of about 8,000 non-native population, some 87 percent are of European nationalities. Very few Asian people inhabit Papua, and it is believed that most of the remainder of the nonindigenous population originate from Australia and other Pacific Island areas.

Climate and Topography

The high mountain cordillera which traverses New Guinea continues from west to east through Papua and the larger island groups. Most of the land suitable to agriculture is confined to the western and southwestern foothill regions of the Fly and Strickland River systems and coastal areas bordering the Gulf of Papua.

Papua, like New Guinea, lies in a heavy rainfall belt and is characterized by the same dual monsoon seasons. Temperature and humidity are uniformly high throughout the year. Summer and winter seasons, as experienced in the temperate latitudes, do not exist. The annual high range of temperature rarely exceeds 90°F. and the mean

minimum rarely falls below 70°F. A curious phenomenon exists in the coastal area surrounding Port Moresby which causes distinct "dry weather" periods with rainfall of about 50 inches a year as compared to an average annual rainfall of more than 100 inches in most of the territory.

Soil advantages for agricultural development in Papua are even more limited than in New Guinea. Little is known about the soils except that the richest ones are found in small deposits in the highland areas. In the coastal regions where agricultural operations such as mechanization are more adaptable, the soils seem to vary in their degrees of fertility. Some are shallow and relatively infertile, while fertile alluvial soils are scattered throughout the coastal plains and in the broad river valleys. Some of the soils are of volcanic origin, and, as in New Guinea, the more fertile volcanic soils are of recent origin, but as the volcanic soils mature, they lose their fertility because of intense leaching.

Land Ownership and Utilization

The land policy is much the same as for New Guinea; namely, that land made available to Europeans for developmental purposes shall be made under conditions to the natives' best interests. Only about 2 million acres of Papua's total land area of approximately 58 million acres belong to the Crown or is owned in fee simple by the non-native population and utilized principally in plantation development. The concept of landownership in Papua varies according to the community in which the land is located. Subject to either individual or community ownership, native land in some areas is farmed in small units by large numbers of natives, regardless of actual owners.

Various departments of the Administrative Government carry out investigations to determine the best land use system for the development of the territory as a whole. Such policy is based on conservation of natural resources and on agricultural improvements as well as crops for export.

No freehold grants of land have been made in Papua since 1906. Like that of New Guinea, land in Papua is available under lease arrangements for crops and livestock production. Both agricultural and pastoral leases are available for terms of 99 years but, unlike the New Guinea practice, no legal limitations apply to the land area which may be leased. The Administration, however, does reserve the right to limit the size of the leases on the basis of the crop grown and its suitability to the land. As yet, leases especially for dairy enterprises are not authorized in Papua.

Agricultural Policy and Development

Development programs for Papua are substantially the same as for New Guinea. (The broad objectives of development are discussed in the section on New Guinea.)

The Department of Agriculture, Stock and Fisheries administers agricultural services for both territories. It gives high priority to extension activities in Papua as a method of advancing the economic status of native farmers. Two separate training schemes are being implemented at the present time: (1) Lower-level training, and (2) higher-level training. The former scheme is designed to increase the farming skill of the Papuan community. Training is given at extension stations, of which the Popondetta and Kapagere agricultural stations and the Kinaro nursery center are the most important. Training includes modern techniques of planting and maintenance of copra, cacao, and coffee. Instruction is also given in soil conservation measures and cultivation of a wide variety of subsistence food crops.

The higher-level training consists of a course of instruction given at the Mageri agricultural training center near Port Moresby to prepare Papuans for agricultural positions in the public service of the territory. Instruction includes courses in agricultural methods, farm economics, botany, and plant diseases.

Agricultural research for Papua is coordinated by the Department of Agriculture, Stock and Fisheries in Port Moresby. Stations and laboratories for various types of agricultural research are as follows:

(1) Research on soils, crops, livestock, and pest eradication are centered in laboratories and stations near Port Moresby.

(2) A station at Epo performs all experimental work in connection with rice. Rice improvement programs have been introduced which are suited to the peculiar cultivation conditions existing in both Papua and New Guinea.

(3) A highlands livestock station and a rubber experimental station are both located at Bisianumu.

(4) Popondetta and Kapogere are both centers of tree-crop experimentation and are emphasizing research on cacao. The chief coconut experimental station is located on Orangerie Bay near the southeastern mainland of Papua.

Types of Farming

As in New Guinea, three types of agriculture prevail in Papua: (1) Plantation crops, generally grown by Europeans, (2) cash cropping by both Europeans and natives, and (3) subsistence farming by the natives.

Aside from plantations, European agriculture is characterized by more and more mechanization, particularly in the rice-growing areas of the Mekeo plain. Europeans are also engaging in numerous farm ventures near urban areas, specializing in the production of fresh vegetables for consumption in rapidly growing urban centers, such as Port Moresby.

Much of the native agriculture is still primitive and largely of a subsistence type. (For the main subsistence crops see page 8.) Emphasis, however, is now being given not only to promotion of cash crops but to the increase of subsistence food production by more efficient methods of cultivation.

Principal Crops

Coconuts and copra. -- The Administration continues to encourage the planting of coconuts in the Northern, Milne Bay, Central, Gulf, and Western Districts of Papua. As in New Guinea, copra constitutes the chief export item from both a quantity and value standpoint. Expansion of the commercial production of this crop by natives and non-Papuans has been emphasized since 1955 by an action plan similar to the one adopted for New Guinea. An increase has been noted in acreage planted, and efforts have also been made to improve methods of drying copra to assure a higher-quality product for marketing.

Table 3.--Papua: Principal agricultural exports, average 1934-38, annual 1951-57 1/

Product	Average 1934-38	1951	1952	1953	1954	1955	1956	1957 <u>2/</u>
	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>	<u>S. tons</u>
Copra	11,872	12,524	16,285 <u>3/</u>	13,709 <u>3/</u>	12,979	18,867	20,097	20,160
Cacao	--	<u>4/</u>	2	12	16	29	34	48
Coffee	1	1	2	3	4	6	8	17
Rubber	1,445	2,448	3,575	3,651	3,522	4,023	3,744	4,442

NOTE: Data are not available for both native and non-native production. Exports are believed to include native marketings and more representative of actual crop production.

1/ Year ending June 30. 2/ Estimated, 3/ Includes coconut oil, 4/ Not available.

Rubber.--Rubber is produced in Papua but not in New Guinea. It has been a well-established part of Papua's agriculture since the early 1900's. The main areas of production are on the Sogeri Plateau east of Port Moresby and the Kanosia area about 40 miles northwest of the capital. Other plantations are located near Milne Bay along the Kemp Welch River, southeast of Rigo. Rubber has been primarily a European development because of native lack of interest in it as a cash crop. The work involved in maintaining rubber plantations is too constant and regular to fit into the native Papuan environment. Most of the plantations were out of production during World War II.

Early in 1954, the Australian Government subsidized this crop through the importation of high-yielding planting material from Malaya and Ceylon. Production has expanded in recent years and in 1956 was estimated at about 4,000 long tons. Exports have also tended to increase. It is estimated that Papua now supplies Australia with about 8 percent of its normal rubber requirements.

Future expansion of the crop has been encouraged by the experimental work carried out at the station in Bisianumu. This station controls the importation and maintenance of stocks of high-quality planting material and surveys areas believed suitable for production by the natives. To improve the quality of the product, the Administration has installed a more modern grading and inspection system. Although most of the Papuan rubber is consumed by Australian industry, it is possible that this product could be exported to other markets, at such time as the quality and price become more competitive with other producing countries.

Cacao.--Production of cacao is gradually expanding in Papua, but the potential for development of this crop is not nearly so great in Papua as in New Guinea. The planted acreage in 1955-56 totaled 2,318 as compared to approximately 1,700 in the previous year. Most of the cacao is grown near the northern coast, and attention is now being given to interplanting of cacao trees with coconuts along the northern coastal areas and other parts of the country where limited areas of more fertile alluvial soils exist. All plantings are being closely supervised by the Administration's agricultural extension services.

Coffee.--Increasing interest is being shown by the Papuans in coffee, as greater cash remuneration seems assured with less labor on the part of the farmer as compared to rubber. Coffee was a prewar crop in the Northern District; replantings were encouraged by the Administration and by 1949 were well established. All of these accomplishments were nullified by the volcanic eruption of Mount Lamington in 1951. For about 2 years after that, little attention was given to the reestablishment of coffee, as all efforts were bent on resettlement of the area and planting of basic food crops. By 1955-56, coffee was again beginning to assume some importance in three areas--the Northern, Milne Bay, and Central Districts. Robusta-type coffee

is the primary crop, although experiments have been made with small acreages of Arabica in the highlands of the Central District.

Rice.--In recent years, rice production has been encouraged among Papuan farmers in all districts of the territory.

A coordinated plan for increased development was outlined for both Papua and New Guinea in 1954. Areas in Papua which appear to have the best potential for rice cultivation are the Fly-Strickland River system, the Mekeo area near Epo, and parts of the coastal plains. Most of the Mekeo development has been mechanized.

Dry-rice farming has been introduced into the indigenous crop scheme. Grown as a cash crop, the rice, planted and harvested by hand, is an important complement to subsistence farming, particularly in the Milne Bay District.

Table 4.--Papua: Livestock numbers, prewar and 1951-57 1/

Item	Prewar	1951	1952	1953	1954	1955	1956	1957 <u>2/</u>
Cattle	7,000	1,719	1,830	1,888	2,878	3,293	3,630	4,098
Goats	1,000	1,252	1,592	1,608	1,714	2,014	2,218	<u>3/</u>
Pigs	1,000	317	303	432	459	626	728	<u>3/</u>
Sheep	<u>3/</u>	15	320	347	319	237	153	133
Horses	<u>3/</u>	304	332	404	443	466	419	443
Poultry <u>4/</u>	6,000	5,703	5,055	5,457	2,383	<u>3/</u>	<u>3/</u>	<u>3/</u>

1/ Non-native holdings only, 2/ Estimated, 3/ Not available, 4/ Commercial flocks.

Livestock

At the present time, the pastoral industry is of minor economic importance. The only livestock utilized to any degree by Papuans is pigs. Methods of animal husbandry and management are not too well advanced. So far there are no provisions for census enumeration of livestock numbers kept by the natives.

European production of cattle has been given quite a stimulus by the Australian Government, which is subsidizing the importation of cattle. The subsidy is equal to freight costs on above-average quality cattle and is attracting interest of European livestock owners and prospective settlers.

As in New Guinea, experiments in Papua are being made with cross-breeding of certain British and Asiatic strains in the hope of finding a type of cattle most suited to Papua's tropical conditions. Present policy also aims at building up cattle numbers. Heavy destruction during World War II reduced cattle numbers to low levels.

